

Claims

1. A process for producing a shaped body by selective laser melting, in which a shaped body is built up from pulverulent metallic material using CAD data of a model, comprising the following steps:
applying a powder layer using an applicator unit,
fixing the applied powder layer to a layer below it using a focused laser beam,
applying the powder layer selectively by the applicator unit to regions of a surface of the shaped body that lie below or adjoin a plane that is defined by a predetermined layer thickness for a next powder layer that is to be processed.
2. The process according to Claim 1, further comprising the steps of:
recording areas that lie below or adjacent to a plane of the predetermined layer thickness for the next powder layer to be processed by means of a device, and
applying the material powder in finely defined form in those areas.
3. The process according to Claim 1, wherein the applicator unit is positioned above the surface of or passes over the shaped body one or more times.
4. The process according to Claim 1, wherein the powder layer is levelled to a desired layer thickness as a result of a levelling device being positioned at least once above the shaped body or as a result of a levelling device passing over the shaped body at least once, and in that projecting sections of the layer which was melted last using the laser beam which project above the desired layer thickness of the applied powder are uncovered by the levelling device.
5. The process according to Claim 4, wherein the laser beam is guided over a predetermined area of the material-powder layer in a plurality of tracks, and the material powder applied

is melted at the point of incidence of the laser beam, and the projecting sections lying in the predetermined areas are at least partly melted and integrated with the adjoining melted powder layer.

6. The process according to Claim 4, wherein the levelling device passes over the shaped body at least twice, and preferably three times, in order to level the material powder to be applied.
7. The process according to Claim 4, wherein the material powder which is applied to the shaped body by the applicator unit is immediately afterwards levelled to the desired height by the levelling device.
8. The process according to Claim 7, wherein the applicator unit is coupled to the levelling device for the application and levelling.
9. A device for producing a shaped body by selective laser melting for carrying out the process according to Claim 1, comprising
a process chamber comprising a build-up chamber for the shaped body,
an applicator unit that, after the shaped body has been positioned, applies a layer of powder a next desired layer thickness, when positioned above the shaped body or passed over the shaped body at least once, wherein the applicator unit has selecting means for the selective application of the powder layer.
10. The device according to Claim 9, comprising at least one levelling device comprising individual elements that pull off the powder layer down to the desired layer thickness and uncover the projecting sections of the layer below that project above the desired layer thickness.

11. The device according to Claim 10, wherein the levelling device has at least one row of individual elements that can be deflected when passing over projecting sections.
12. The device according to Claim 10, wherein the individual elements of the levelling device comprise free ends that lie in a common plane.
13. Device according to Claim 10, wherein the levelling device is comprised as a brush.
14. The device according to Claim 13, wherein the levelling device comprises a plurality of bristles that lie in a row and has at least two rows for bristles.
15. The device according to claim 14, wherein the bristles are of metallic form.
16. The device according to Claim 13, wherein the levelling device has bristles which lie close together.
17. The device according to Claims 10, wherein the individual elements of the levelling device comprise a lip with at least one row of small plates.
18. The device according to Claim 17, wherein the individual elements are produced from a thin sheet-metal layer, preferably by laser cutting.
19. The device according to Claim 17, wherein the small plates are arranged adjacent to one another by fine cut lines.
20. The device according to Claim 10, wherein the levelling device has individual elements that are arranged in such a manner that they are deflected by means of an articulated joint.
21. The device according to Claim 20, wherein the individual elements comprise a damping element on at least one side close to the articulated joint.
22. The device according to Claim 9, wherein the applicator unit comprise at least one scanning element with a closure section that interacts with an opening in the applicator unit

and opens or closes the opening in the applicator unit as a function of a size of a projecting section.

23. The device according to Claim 22, wherein the scanning element comprises a middle area which, irrespective of a position of the closure section in the opening, interacts with a further section of the opening and limits the maximum quantity of powder which can be discharged.